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Your reference: Centriscrew
Application number: GB 0308774.9

11 February 2004

With Compliments

Yours sincerely

J. A. Millinship

Judith A Millinship
Formalities Examiner

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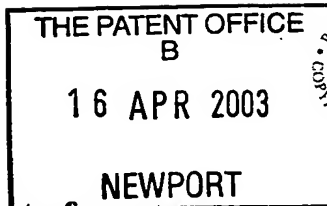
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16APR03 E800685-1 C64191
041/7700 0400-0300774.9

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference CENTRISCREW

2. Patent application number
(The Patent Office will fill in this part) 0308774.9

3. Full name, address and postcode of the or of each applicant (underline all surnames) ADRIAN ALEXANDER HIBBARD
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WV10 8AU 793340/001

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention
COMPOUND CENTRIFUGAL AND
SCREW COMPRESSOR

5. Name of your agent (if you have one)
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
39 EGERTON ROAD
BUSHBURY
WOLVERHAMPTON
WEST MIDLANDS
WV10 8AU

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Patents Form 1/77

Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	0 SHEETS
Description	2 SHEETS
Claim(s)	1 SHEET
Abstract	1 SHEET
Drawing(s)	6 SHEETS

186 *ph*

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

ONE / *ph*

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

A. Hubbard

Date

15/04/03

12. Name and daytime telephone number of person to contact in the United Kingdom

ADRIAN HUBBARD
(01902) 654568

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Notes

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COMPOUND CENTRIFUGAL AND SCREW COMPRESSOR

Present technology for gas turbines is an axial flow compressor comprising many individual parts and having great complexity and weight. Alternatively a centrifugal compressor can be employed, which is much simpler and lighter than an axial flow compressor but has a much lower pressure ratio. The invention disclosed herein sets out to provide simplicity and high pressure ratios in the same compressor. Also this compressor can be used for a great many other applications.

According to the present invention there is provided a compounded centrifugal and screw compressor comprising two separate sections. The first section is a conventional centrifugal compressor body with a plurality of radial vanes on the front face. The second section of the compressor is a screw type compressor with a plurality of helical vanes mounted on a conical screw body; the helical vanes are lesser in number than the radial vanes, typically one quarter to one third, and mate up with longer radial vanes at the extremity of the centrifugal compressor rim. The conical screw body is the same diameter as the outer rim of the centrifugal compressor and reduces down at the output end. The helical vanes each complete one full turn. The compressor is manufactured in two separate parts only, each part being in one piece; the two parts are mounted on a driven shaft. The whole compressor is enclosed in a casing with an inlet at the centrifuge end and an exhaust at the smaller end of the screw body. The casing ducts the compressed air within. This compressor is suitable for gas turbines, turbochargers, superchargers and the like.

Figure 1 is a side view of the complete compressor, with the casing cut open.

Figure 2 is a front view of the centrifuge, with no casing.

Figure 3 is an exploded view showing the compressor main parts.

Figure 4 is a drawing showing the compressor used in a turboshaft application.

Figure 5 is a drawing showing the compressor used in a turboprop application.

Figure 6 is a drawing showing the compressor used in a turbofan application.

Referring to the drawings there is provided a compounded centrifugal and screw compressor comprising two separate sections. The first section is a conventional centrifugal compressor body 2 with a plurality of long radial vanes 3 and short radial vanes 4 on the front face. The second section of the compressor is a screw type compressor with a plurality of helical vanes 6 mounted on a conical screw body 5; the helical vanes 6 are lesser in number than the short radial vanes 4 and the same in number as the long radial vanes 3, being typically one quarter to one third, and mate up with longer radial vanes 3 at the extremity of the centrifugal compressor rim 2. The conical screw body 5 is the same diameter as the outer rim of the centrifugal compressor 2 and reduces down at the output end. The helical vanes 6 each complete one full turn; the compressor is manufactured in two separate parts only, each part being in one piece; the two parts are mounted on a driven shaft 1. The whole compressor is enclosed in a casing 7 with an inlet at the centrifuge 2 end and an exhaust at the smaller end of the screw body 5. The casing ducts the compressed air within. This compressor is suitable for gas turbines, turbochargers, superchargers and the like. See figures 1, 2 and 3.

Referring to figure 4 the compressor is fitted within a turboshaft engine with combustion chambers 8, turbine 9 for driven shaft 1 and a turbine 10 for output shaft 11.

Referring to figure 5 the compressor is fitted within a turboprop engine with combustion chambers 8, turbine 9 for driven shaft 1 and turbine 12 for propeller 13.

Referring to figure 6 the compressor is fitted within a turbofan engine with combustion chambers 8, turbine 14 for driven shaft 1 and low pressure fan 17; with a turbine 15 for high pressure fan 16.

The compressor has a pressure ratio in the region of 32 : 1.

CLAIMS

What is claimed is:-

1. A compound compressor of simple and lightweight construction with a high pressure ratio comprising:-

a centrifugal compressor with a plurality of radial vanes on the front face;
 some said radial vanes are short radial vanes and finish at the centrifuge rim;
 some said radial vanes are long radial vanes and overhang the centrifuge rim;
 said long radial vanes are one quarter to one third in number of said short radial vanes;
 a conical screw body;
 said body mates up to said rim and extends behind said rim further aft;
 said body tapers towards the rear;
 said body has a plurality of helical vanes;
 said vanes are the same in number as said long radial vanes;
 said helical vanes mate up with said long radial vanes at said centrifuge rim;
 said helical vanes each complete one full turn;
 a driven shaft;
 said centrifuge and said screw body are complete and separate parts;
 said parts form whole compressor;
 said compressor fits onto said shaft;
 a compressor casing surrounding said parts;
 said casing encloses the air within.

2. A compound compressor as claimed in claim 1 manufactured as a turboshaft compressor.

3. A compound compressor as claimed in claim 1 manufactured as a turboprop compressor.

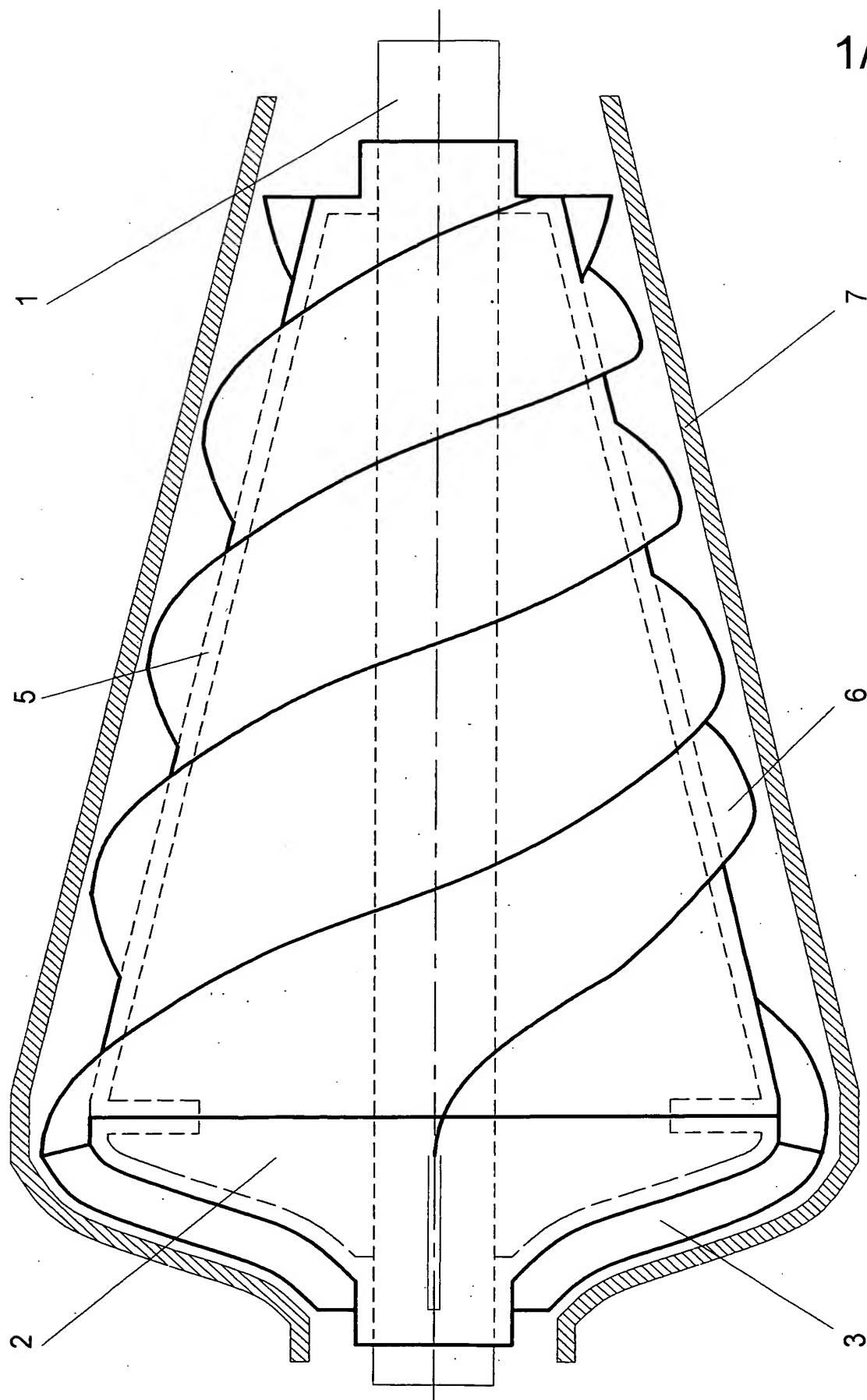
4. A compound compressor as claimed in claim 1 manufactured as a turbofan compressor.

ABSTRACT

A compounded centrifugal and screw compressor comprising two separate sections. The first section is a conventional centrifugal compressor body 2 with a plurality of radial vanes 3 and 4 on the front face. The second section of the compressor is a screw type compressor with a plurality of helical vanes 6 mounted on a conical screw body 5; the helical vanes 6 are lesser in number than the short radial vanes 4 and the same in number as the long radial vanes 3, typically one quarter to one third, and mate up with longer radial vanes 3 at the extremity of the centrifugal 2 compressor rim. The conical screw body 5 is the same diameter as the outer rim of the centrifugal compressor and reduces down at the output end. The helical vanes each complete one full turn.

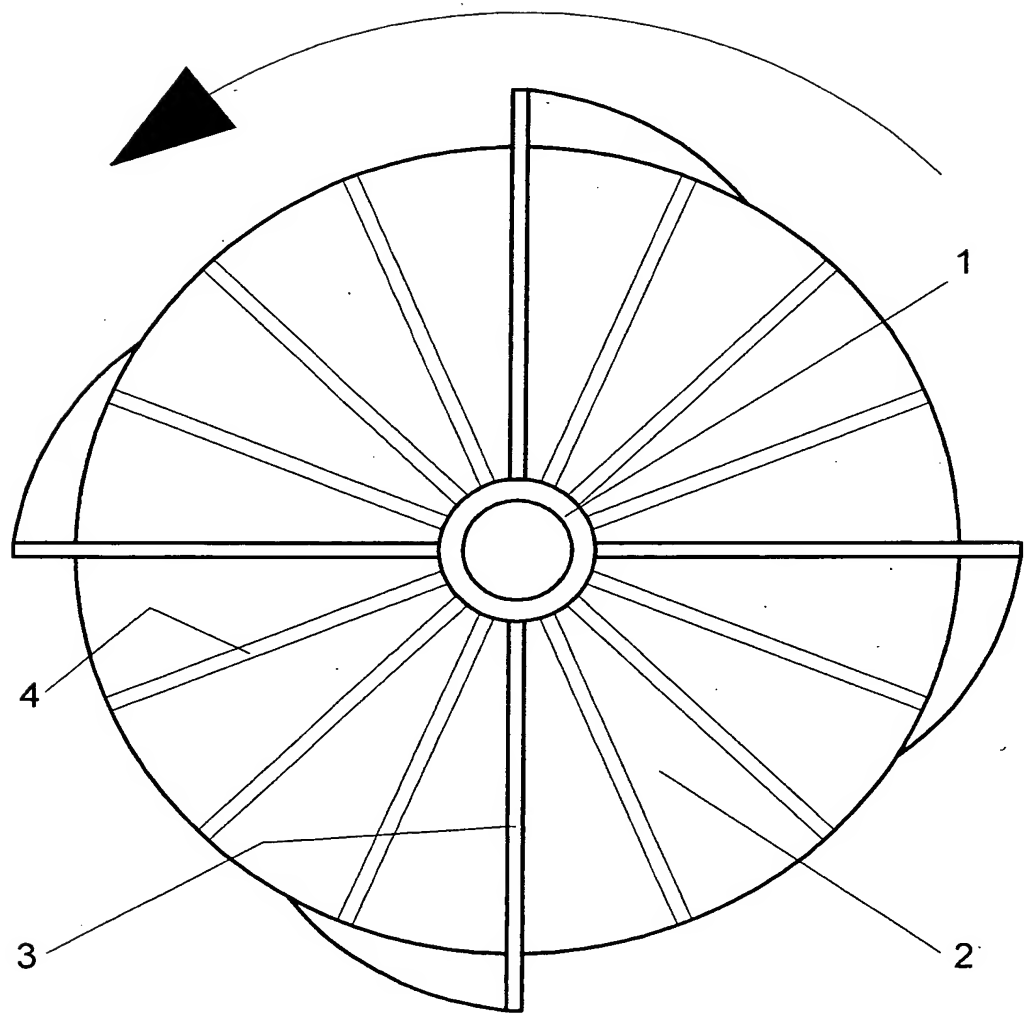
Use Figure 1

FIG 1



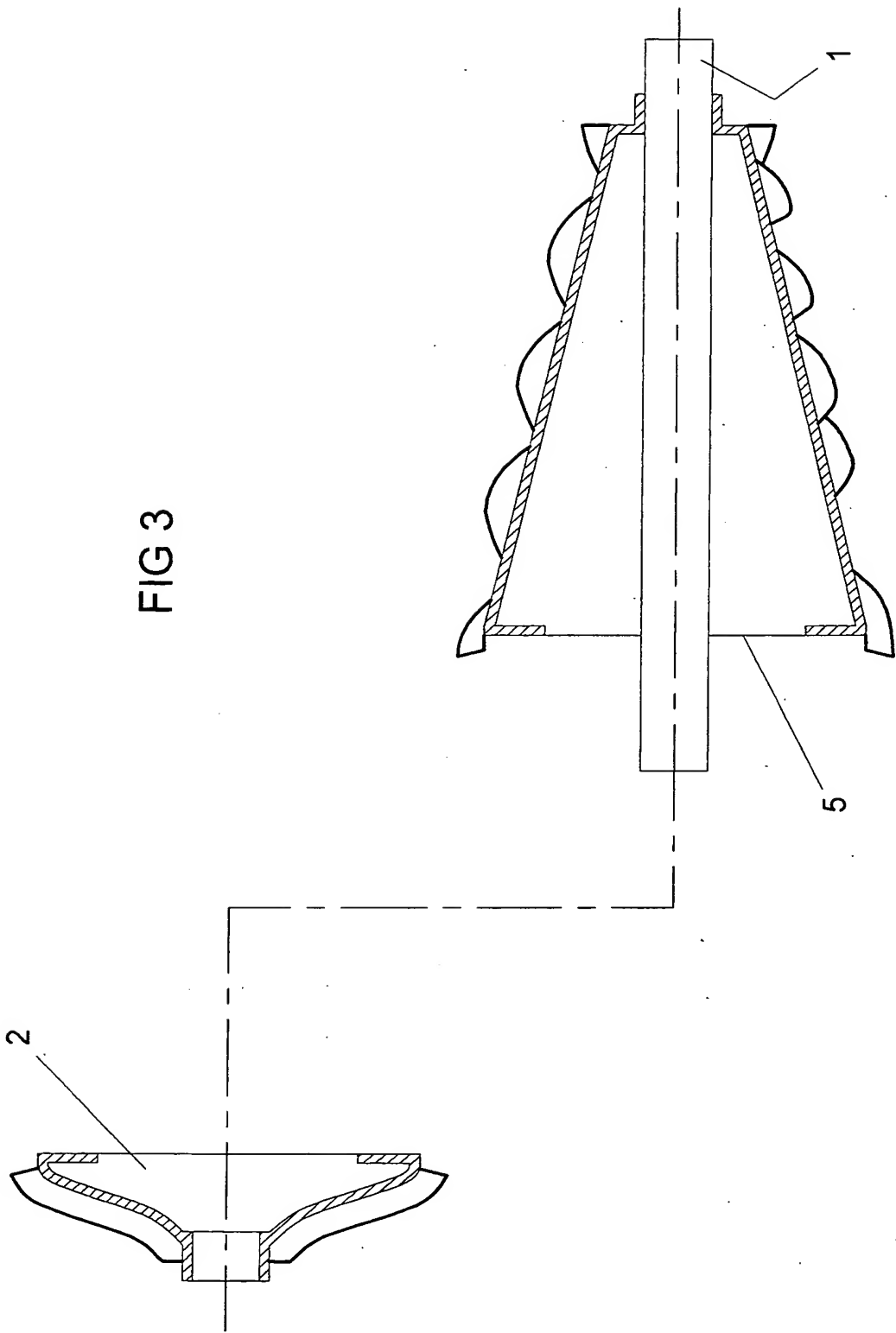
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FIG 2



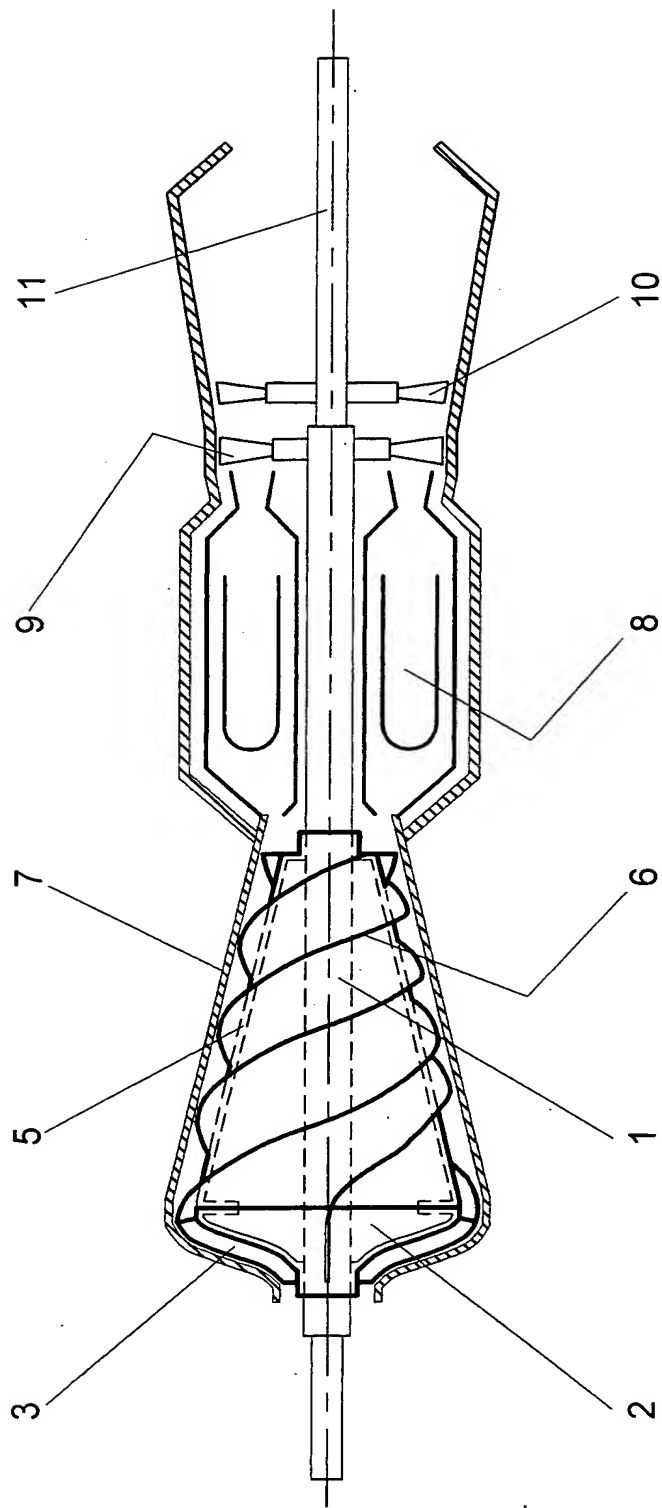
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FIG 3



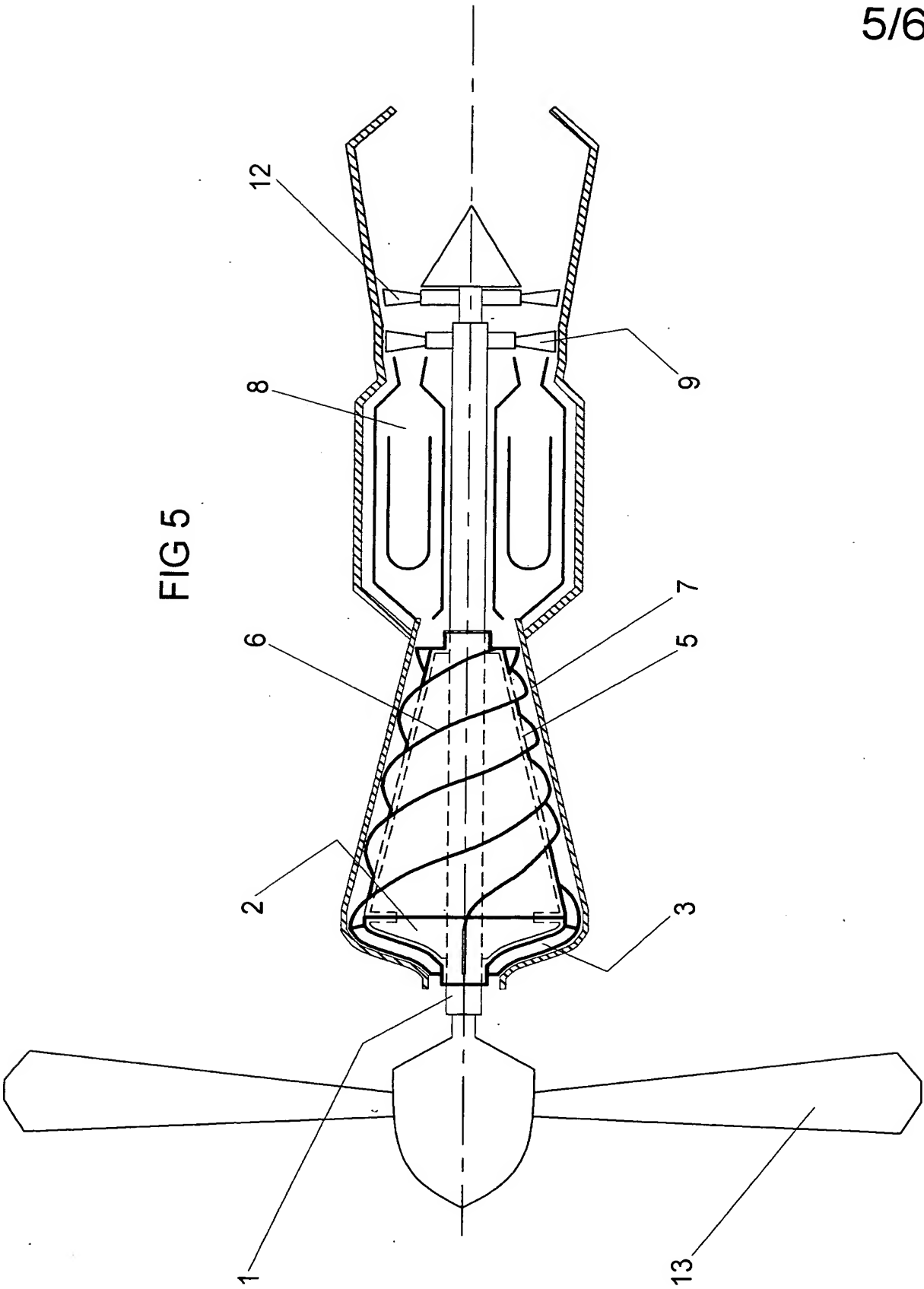
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FIG 4



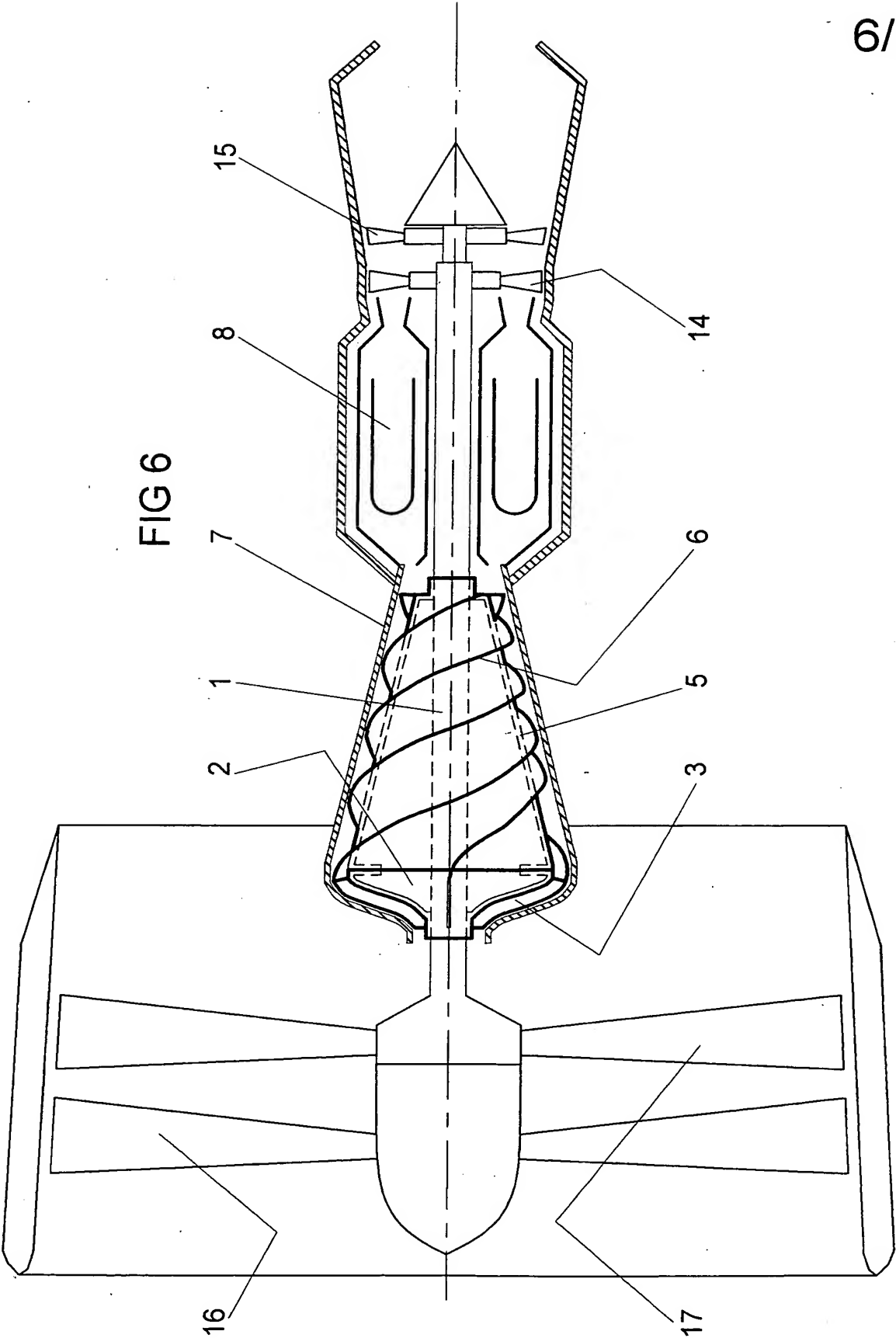
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FIG 5



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FIG 6



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